

Arizona PUC decision to allow a \$0.70/month/kW or about \$5 monthly charge to PV owners.

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According to Reuters in the Chicago Tribune, "Arizona regulators on Thursday (14 Nov. 2013) dealt a blow to the state's largest utility by approving a monthly fee of (which in Arizona amounts to about \$5/month) on customers with solar panels that Arizona Public Service said was not enough to offset the (\$50 to \$100/month) costs that those rooftop systems have heaped on its remaining ratepayers...." The charge will only apply to customers who install solar systems after December 31 of this year, meaning the 20,000 APS customers who already have solar panels will not see changes to their bills." [1] According to Morris News Service (18 Nov. 2013), "... Georgia Power dropped its request to charge an average \$22/month fee to home-owners who install solar panels on their roofs, arguing that the fee was needed because customers who produced their own power were not paying for their share the utility's grid costs. But this withdrawal may only be temporary....and may be submitted at another time"

In wondering how the Arizona regulators might have come up with the \$0.70/kW or the \$5/month figure and how that jives with the ~\$20 we pay in Hawaii under the label of "Minimum Monthly Charge", I found that the \$5 monthly fee agrees with a number one can derive for the combined, transmission and distribution costs for each "small" ratepayer. This number represents an actual, average, 30-year-levellized transmission and distribution capital & maintenance cost contributions by some utilities, and was derived as follows:

The website of the Energy Information Agency (EIA) and that of the Institute for Energy Research, shows only data on the contribution that **transmission** capital investment makes, on average, to the 30-year-levelized electricity rate, which is listed as 1.2 to 1.4, i.e. an average of 1.3 US\$/MWh [2], compared to the contribution by total plant investments ranging from 65 US\$/MWh (for natural gas) to 135 US\$/MWh (for a combustion turbine). Missing was the contribution of electricity distribution.

An Ergon (Australian utility) website shows that the capital investment contribution of "**distribution**" needed for small users may be 7.2x higher than the one by the investment in transmission [3], so that $(1 + 7.2) \times 1.3 = 10.7$ US\$/MWh would include both transmission and distribution, and if we can assume that that 7.2 ratio may also hold for Arizona and Hawaii's Big Island. For an average 500 kWh/month consumer, the monthly transmission and distribution bill for that ratepayer connection, which would be laid out for consuming 500 kWh/month, would then amount to $10.7/1000 \text{ $/kWh} \times 500 \text{ kWh} = 5.4 \text{ $/month}$, regardless of the \$/kWh cost of electricity, and regardless of whether the ratepayer actually consumed 500 or 0 kWh/month after he was connected to the grid.

However – if all ratepayers were to install PVBBs and strive for minimal grid use, i.e. for high **self-consumption** of the generated PV energy, e.g. by also installing and properly programming Battery Backup (**PVBB**), the utility would not have to install utility-sized storage means such as batteries. We know that such battery additions may add 4-5 ¢/kWh to the actual 30-year levelized electricity rate when PVBBs are installed at each home or business. An allowance of 4 ¢/kWh rate increase by utilities to install large backup batteries would amount to an extra monthly charge of $0.04 \times 500 = \$20$ for an average residential ratepayer, which (strangely enough) also happens to be the Minimum Monthly Charge we already pay now on the Big Island, but not the \$50-100, which Arizona utilities were demanding.

In order to minimize transmission losses, benefit from uninterruptible power (despite grid outages), maximize overall energy security (due to greater safety with a large number of distributed generators, especially after hurricanes or earthquakes), and (in my opinion) minimizing rate-payer electricity cost -- distributed, roof-top, grid-tied PVBBs win the contest hands down against large-scale utility PVBBs.

References

- [1] http://articles.chicagotribune.com/2013-11-14/news/sns-rt-us-solar-arizona-20131114_1_net-metering-solar-customers-aps
- [2] <http://www.instituteeforenergyresearch.org/levelized-costs-of-new-electricity-generating-technologies/>
- [3] According to https://www.ergon.com.au/_data/assets/pdf_file/0006/157731/EE-Pricing-Proposal-2013-14_AER-Approved-Public_v1.1_7June2013.pdf, the "Distribution Use of System" (DUOS) and the "Transmission Use of System" (TUOS) proposed for 2013-2014 for small users in the under 100 MWh/year category, are listed in the Table on p.74 as 0.983 and 0.137 AU\$/day, i.e. the ratio DUOS/TUOS = 7.2. The total network (transmission and distribution) revenue that the T & D company Ergon Energy [4] needs to recover in 2013-2014 from network users is approximately AU\$1,930 million, which is 14.60 % above what was recovered from network users in 2012-13.
- [4] Ergon Energy, a major Australian transmission and distribution company in Queensland, has around 5,000 employees, a \$10.6 billion asset base (>1 million poles, >150,000 km of power lines, etc) and 700,000 customers.